

Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the above-identified application.

Listing of Claims

1. **(Currently amended)** A method for accessing data from an enterprise data system via [[user]] voice input, comprising:
 - authenticating a user using a login process in which the user is identified by a unique ~~voice user identifier~~; login, wherein the authenticating comprises:
 - querying a database with a voice identifier,
 - in response to the querying, verifying the voice identifier and receiving a
 - password for the enterprise data system from the database, and
 - establishing a connection with the enterprise data system using the password for
 - the enterprise data system;
 - ~~transparently logging the user into the enterprise data system through use of information~~
 - ~~obtained during authentication of the user;~~
 - enabling access to the user to access a domain of the enterprise system after logging into
 - ~~the enterprise data system, each domain corresponding to a particular data system,~~
 - wherein each of a plurality of domains of the enterprise data system corresponds
 - to a respective object or type of data;
 - receiving a spoken language query to enabling the user to request an ad hoc query be
 - performed against data stored [[by]] in the accessed domain using a spoken
 - natural language query and enabling the user to navigate in the accessed domain
 - using spoken navigation ;
 - converting the spoken ~~natural~~ language query into a data query and executing the data
 - query to retrieve [[any]] data that corresponds to the query in the accessed
 - domain; and in the accessed domain corresponding to the ad hoc query;
 - providing feedback data corresponding to data retrieved from the accessed domain in a
 - verbal format ~~to the user.~~

2. **(Currently amended)** The method of claim 1, wherein the data query includes reference to a unique enterprise data system user identifier such that the ~~ad-hoc~~ data query returns user-specific data.
3. **(Currently amended)** The method of claim 1, wherein the login comprises a user ~~is enabled to log into the voice access systems using the~~ unique user identifier and a personal identification number (PIN).
4. **(Currently amended)** The method of claim 1, further comprising:
 - converting the spoken ~~natural~~ language query into a data request in an application-readable form;
 - identifying one or more ~~object(s)~~ objects and data criteria corresponding the spoken ~~natural~~ language query by processing the data request; and
 - formulating the data query based on the identified ~~[[any]]~~ objects and data criteria ~~that are identified~~.
5. **(Currently amended)** The method of claim 4, wherein the enterprise data system includes an object manager and data manager that are used to enable access to data stored in an enterprise database, further comprising:
 - passing information corresponding to the identified ~~[[any]]~~ objects and data criteria ~~that are identified~~ to the object manager;
 - formulating a database query based on the objects and data criteria passed to the object manager in consideration of enterprise database schema information available to the data manager;
 - submitting the database query to the enterprise database;
 - receiving a result set back from the enterprise database in response to the database query;
 - and
 - processing the result set to produce the feedback data.

6. **(Currently amended)** The method of claim 5, further comprising:
 extracting object data from the result set; and
 defining a ~~prompt~~ and slotted data string corresponding to a grammatical form in which
 data are to be presented; ~~presented to a user~~;
 embedding the object data into slots in the ~~prompt~~ and slotted data string to produce the
 feedback data.

7. **(Currently amended)** The method of claim 1, wherein converting the spoken ~~natural~~
 language query into the data query comprises:
 receiving ~~[[user]]~~ voice input as digital waveform data;
 passing the digital waveform data to a voice recognition component;
 receiving application-readable data from the voice recognition component corresponding
 to the spoken ~~natural~~ language query; and
 processing the application-readable data to identify data to be retrieved. ~~determine what~~
~~data the user desires to retrieve~~.

8. **(Currently amended)** The method of ~~claim 2~~ claim 1, further comprising:
 defining a grammar syntax language comprising a plurality of grammars specifying
 grammatical formatting of legal ~~[[user]]~~ inputs; and
identifying data to be retrieved ~~determining what the user desires to retrieve~~
 by processing ~~[[user]]~~ voice input in consideration of the grammar syntax
 language.

9. **(Currently amended)** The method of claim 1, wherein providing feedback data corresponding to data retrieved from the enterprise data system in a verbal format ~~to the user~~ comprises:

defining a ~~text and~~ slotted data string corresponding to a grammatical form in which data are to be presented ~~to a user~~;

embedding data retrieved from the enterprise data system in slots defined in the ~~text and~~ slotted data string to form an embedded data text string;

passing the embedded data text string to a text-to-speech conversion component;

receiving digital waveform data from the text-to-speech conversion component corresponding to the embedded data text string;

streaming the digital waveform data to a device that produces an audible sound in response to processing the digital waveform data to produce a verbalized feedback ~~to the user~~.

10. **(Currently amended)** The method of claim 9, wherein a plurality of ~~text and~~ slotted data strings are defined, each corresponding to a respective system response, further comprising:

determining a current navigation context ~~of the user~~; and

selecting an appropriate ~~text and~~ slotted data string from among ~~[[said]]~~ the plurality of ~~text and~~ slotted data strings based, at least in part, on the current navigation context ~~of the user~~.

11. **(Currently amended)** The method of claim 9, wherein a plurality of ~~text and~~ slotted data strings are defined, each corresponding to a respective system response, further comprising:

identifying attributes corresponding to data retrieved from the enterprise data system; and

selecting an appropriate ~~text and~~ slotted data string from among ~~[[said]]~~ the plurality of ~~text and~~ slotted data strings based, at least in part, on the identified attributes ~~[[any]] attributes corresponding to data retrieved from the enterprise data system that are identified~~.

12. **(Currently amended)** The method of claim 1, wherein providing feedback data corresponding to data retrieved from the enterprise data system in a verbal format ~~to the user~~ comprises:

storing a plurality of prompt audio files, each comprising prompt digital waveform data that when processed produces a verbalized prompt comprising one or more words;

defining a ~~prompt identifier and~~ slotted data string specifying a grammatical form in which data are to be presented ~~to a user~~ by identifying prompt audio files to be streamed and ~~defining in order~~ specifying where data are to be inserted relative to the identified prompt audio files; any prompts audio files that are identified;

passing data retrieved from the enterprise data system to a text-to-speech conversion component;

receiving text-to-speech (TTS) digital waveform data from the text-to-speech conversion component in response to the passing; ~~corresponding to the data passed to it;~~

streaming prompt digital waveform data retrieved from the identified prompt audio files and the prompt and TTS digital waveform data to a device that produces an audible sound in response to processing the retrieved prompt digital waveform data and the TTS digital waveform data to produce a verbalized feedback to the user, wherein the streaming is performed according to an order portions of the prompt and TTS digital waveform data are streamed, in order, based on an ordered defined by the prompt identifier and slotted data string, and prompt digital waveform data is retrieved from prompt audio files corresponding to the prompt identifiers.

13. **(Currently amended)** The method of claim 12, wherein a plurality of ~~prompt identifier and~~ slotted data strings are defined, each corresponding to a respective system response, further comprising:

determining a current navigation context ~~of the user;~~ and

selecting an appropriate ~~prompt and~~ slotted data string from among ~~[[said]]~~ the plurality of ~~text and~~ slotted data strings based, at least in part, on the current navigation context ~~of the user.~~

14. **(Currently amended)** The method of claim 12, wherein a plurality of ~~prompt identifier~~ and slotted data strings are defined, each corresponding to a respective system response, further comprising:

identifying attributes corresponding to data retrieved from the enterprise data system; and selecting an appropriate ~~prompt identifier~~ and slotted data string from among ~~[[said]]~~ the plurality of ~~text~~ and slotted data strings based, at least in part, on ~~[[any]]~~ the identified attributes ~~corresponding to data retrieved from the enterprise data system that are identified.~~

15. **(Currently amended)** A method for accessing an enterprise data system via a voice communications device, comprising:

enabling ~~a user to establish~~ a communications connection to a voice access system; authenticating a login through the communications connection using a the user with the voice access system using a login process in which the user is identified by a unique user identifier; user identifier, wherein the authenticating comprises: querying a database with the user identifier, and in response to the querying, verifying the user identifier and receiving from the database an enterprise data system log-in data comprising a password for the enterprise data system;

~~determining enterprise data system log in data that enables the user to access the enterprise data system, based on the unique user identifier for the voice access system;~~

automatically logging ~~the user~~ into the enterprise data system using the enterprise data system log-in data;

enabling access to the user to access a domain of the enterprise system after the logging into the enterprise data system, each ~~domain~~ of a plurality of domains corresponding to a respective ~~particular~~ object or type of data;

enabling ~~the user to request an ad hoc~~ a request that a query be performed against data stored by the accessed domain using a spoken ~~natural~~ language query and ~~enabling the user to navigate in the accessed domain using spoken navigation;~~

converting the spoken ~~natural~~ language query into a data query and executing the data query to retrieve ~~[[any]]~~ data that corresponds to the query in the accessed domain ~~corresponding to the ad hoc query;~~
 providing feedback data corresponding to data retrieved from the accessed domain in a verbal format ~~to the user~~ via the communications connection.

16. **(Currently amended)** The method of claim 15, wherein the voice communications device comprises a telephone, and the authenticating comprises: ~~and the user is enabled to log into the voice access systems using the unique~~
verifying a user identifier and a personal identification number (PIN) received from the telephone through the communications connection. ~~, each of which may be entered using a keypad on the telephone or via a verbal user input.~~

17. **(Currently amended)** The method of claim 15, further comprising:
 converting the spoken ~~natural~~ language query into a data request in an application-readable form;
 processing the data request to identify one or more objects ~~object(s)~~ and data selection criteria corresponding the spoken ~~natural~~ language query; and
 formulating the data query based on ~~[[any]]~~ identified objects and data selection criteria ~~that are identified.~~

18. **(Currently amended)** The method of claim 17, wherein the enterprise data system includes an object manager and data manager that are used to enable access to data stored in an enterprise database, the method further comprising:
 passing information corresponding to ~~[[any]]~~ identified objects and data selection criteria ~~that are identified~~ to the object manager;
 formulating a database query based on the objects and data selection criteria passed to the object manager in consideration of enterprise database schema information available to the data manager;
 submitting the database query to the enterprise database; and
 receiving a result set back from the enterprise database in response to the database query.

19. **(Currently amended)** The method of claim 18, wherein use of the object manager and data manager abstracts objects from how data corresponding to the objects are stored in the enterprise database such that a schema of the enterprise database is changeable ~~may be changed~~ without requiring ~~[[any]]~~ changes to a ~~[[any]]~~ voice access system component that is external to the enterprise data system.
20. **(Currently amended)** The method of claim 15, further comprising:
 retrieving data pertaining to a selected object ~~for the user~~ from the enterprise data system through use of the ~~unique~~ user identifier upon login to the voice access system;
 and
 providing feedback data corresponding to ~~[[any]]~~ data that are retrieved in a verbal format ~~to the user~~ via the communications connection.
21. **(Currently amended)** A method for accessing an enterprise data system via a telephone, comprising:
 enabling ~~a user to establish~~ a telephone connection to a voice access system;
 authenticating the telephone connection using a user identifier, wherein the authenticating comprises: the user with the voice access system using a login process in which the user is identified by a unique user identifier;
querying a database with the user identifier, and
in response to the querying, verifying the user identifier and receiving from the database an enterprise data system log-in data comprising a password for the enterprise data system;
~~determining enterprise data system log-in data that enables the user to access the enterprise data system, based on the unique user identifier for the voice access system;~~
 automatically logging ~~the user~~ into the enterprise data system using the enterprise data system log-in data;
 providing a voice user interface that ~~enables the user to access~~ enables:
access to a plurality of domains and domains, and

navigation and querying of ~~navigate and query~~ data from an accessed domain using spoken navigation and ~~natural language~~ spoken query commands, wherein each of a plurality of domains ~~domain~~ comprises data corresponding to a respective type of object in the enterprise data system; and

providing feedback data in a verbal format ~~to the user~~ via the telephone connection in response to spoken navigation and ~~natural language~~ spoken query commands, ~~[[said]]~~ the feedback data including; ~~including~~ data corresponding to data retrieved from ~~[[the]]~~ the accessed domain in response to the ~~natural language spoken~~ query ~~commands and~~ commands, and system prompts in response to the spoken navigation commands.

22. **(Currently amended)** The method of claim 21, wherein the voice user interface includes a set of global voice commands that enables ~~the user to~~ a jump from a current domain to a new domain.

23. **(Currently amended)** The method of claim 21, wherein the voice user interface includes voice commands that are context sensitive to a current navigation context, the method further comprising; ~~of the user, such that the user may navigate~~ enabling navigation to another navigation context from a current navigation context using navigation voice commands that are based, at least in part, on the current navigation context ~~of the user~~.

24. **(Currently amended)** The method of claim 21, further comprising: generating a data query to retrieve data from the enterprise data system in response to one of more of the spoken query commands; ~~system, said data query~~ returning a plurality of data sets in response to the data query; and ~~pertaining to an object to which an ad-hoc query of a spoken natural language query command; and~~ enabling browsing of ~~the user to browse~~ the plurality of data sets using verbal input.

25. **(Currently amended)** The method of claim 21, further comprising:
maintaining navigation tracking information for ~~the user~~ that identifies previous
navigation locations ~~the user has previously navigated to~~; and
selecting system prompts based on the navigation tracking information for a ~~[[the]]~~ user
such that the user is presented with a different system prompt if the user has not
previously navigated to a current navigation location than the user is presented
with if the user has previously navigated to the current navigation location.
26. **(Currently amended)** The method of claim 21, wherein the spoken navigation and
~~natural language spoken~~ query commands includes ~~[[an hoc]]~~ a query which comprises a request
to retrieve data corresponding to a domain ~~[[the]]~~ a user is currently in that is provided to the
enterprise data system and returns a plurality of data sets comprising header data identifying
items pertaining to the current domain, the method further comprising:
enabling the user to browse the header data on an item-by-item basis using verbal
navigation commands; and
reading the header data corresponding to each item in response to a user navigation to
that item.
27. **(Currently amended)** The method of claim 26, further comprising:
enabling the user to request detail information corresponding to an item that is currently
being browsed;
retrieving detail information corresponding to the item currently being browsed from the
enterprise database ~~corresponding to the item currently being browsed~~; and
reading the detail information to the user via the telephone connection.

28. **(Currently amended)** A method for accessing an enterprise data system via telephone using a voice access system, comprising:

defining a set of grammars comprising a language and syntax in which data are stored as phonetic representations of the data;

retrieving selected data from the enterprise data system;

pre-compiling at least a portion of the selected data into predefined forms corresponding to the set of grammars;

storing the pre-compiled data in a local database that is apart from the enterprise data system;

receiving a request for a query, wherein the request comprises a spoken language query;

~~enabling a user to request an ad hoc query be performed against data stored in the enterprise data system and/or local database using a spoken natural language query;~~

converting the spoken natural language query into a data request;

if pre-compiled data corresponding to the data request is stored in a ~~[[the]]~~ local database,

retrieving data corresponding to the query from the local database ~~corresponding to the ad hoc query~~; and

if pre-compiled data corresponding to the data request is not stored in the local database,

retrieving data corresponding to the query from the enterprise data system ~~corresponding to the ad hoc query~~; and

providing feedback data corresponding to data that are retrieved in a verbal format ~~to the user via the telephone connection.~~

29. **(Original)** The method of claim 28, wherein header data that are used to identify objects are stored in the local database while detail data corresponding to the objects are stored in the enterprise database.

30. **(Currently amended)** The method of claim 28, further comprising:
defining a set of objects for which data from the enterprise database are to be pre-compiled;
defining a schedule identifying when data corresponding to the set of objects are to be pre-compiled; and
pre-compiling data corresponding to those objects based on the schedule.
- 31 - 34. (Cancelled)
35. **(New)** The method of claim 1, further comprising:
enabling navigation in the accessed domain through spoken navigation commands.
36. **(New)** The method of claim 15, further comprising:
enabling navigation in the accessed domain using spoken navigation commands.
37. **(New)** The method of claim 16, wherein the verifying comprises:
if the user identifier was input in a verbal form, verifying a verbal form user identifier;
if the user identifier was input via a keypad on the telephone, verifying a tone form user identifier;
if the PIN was input in a verbal form, verifying a verbal form PIN; and
if the PIN was input keypad on the telephone, verifying a tone form PIN.
38. **(New)** A system comprising:
an authentication circuit coupled to a database and configured to authenticate a login by:
 querying the database with a voice identifier, and
 in response to the querying, verifying the voice identifier and receiving a password for an enterprise data system from the database;
a connection circuit configured to establish a connection with the enterprise data system using the password for the enterprise data system;
an interface configured to access to a domain of the enterprise data system, wherein each of a plurality of domains of the enterprise data system corresponds to a respective object or type of data;

a query circuit configured to receive a spoken language query to be performed against data stored in the accessed domain;

a retrieval circuit configured to convert the spoken language query into a data query and execute the data query to retrieve data that corresponds to the query in the accessed domain; and

a responder circuit configured to provide data corresponding to the retrieved data in a verbal format.

39. (New) A system comprising:

a grammar definition circuitry configured for defining a set of grammars comprising a language and syntax in which data are stored as phonetic representations of the data;

a first retrieval circuit configured to retrieve selected data from the enterprise data system;

a pre-compilation circuit configured to pre-compile at least a portion of the selected data into predefined forms corresponding to the set of grammars;

a memory configured to store the pre-compiled data in a local database that is apart from the enterprise data system;

a receiver module configured to receive a request for a query, wherein the request comprises a spoken language query;

a conversion circuit configured to convert the spoken language query into a data request;

a second retrieval circuit configured to:

- if pre-compiled data corresponding to the data request is stored in a local database, retrieve data corresponding to the query from the local database;
- and
- if pre-compiled data corresponding to the data request is not stored in the local database, retrieve data corresponding to the query from the enterprise data system; and

a responder circuit configured to provide data corresponding to the retrieved data in a verbal format.

40. (New) A computer readable medium comprising instructions executable on a processor, wherein the instructions are operable to implement each of:

authenticating a login, wherein the authenticating comprises:

querying a database with a voice identifier;

in response to the querying, verifying the voice identifier and receiving a password for an enterprise data system from the database; and

establishing a connection with the enterprise data system using the password for the enterprise data system;

enabling access to a domain of the enterprise data system, wherein each of a plurality of domains of the enterprise data system corresponds to a respective object or type of data;

receiving a spoken language query to be performed against data stored in the accessed domain;

converting the spoken language query into a data query and executing the data query to retrieve data that corresponds to the query in the accessed domain; and

providing feedback data corresponding to data retrieved from the accessed domain in a verbal format.

41. (New) A computer readable medium comprising instructions executable on a processor, wherein the instructions are operable to implement each of:

defining a set of grammars comprising a language and syntax in which data are stored as phonetic representations of the data;

retrieving selected data from an enterprise data system;

pre-compiling at least a portion of the selected data into predefined forms corresponding to the set of grammars;

storing the pre-compiled data in a local database that is apart from the enterprise data system;

receiving a request for a query, wherein the request comprises a spoken language query;

converting the spoken language query into a data request;

if pre-compiled data corresponding to the data request is stored in a local database,

retrieving data corresponding to the query from the local database; and

if pre-compiled data corresponding to the data request is not stored in the local database,
retrieving data corresponding to the query from the enterprise data system; and
providing feedback data corresponding to data that are retrieved in a verbal format.